

A NEW SPECIES OF FOSSIL TURTLE FROM THE UPPER SIWALIKS OF PINJORE, INDIA

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ABSTRACT. A new species of freshwater fossil turtle, *Geoclemys sivalensis* n. sp. is described from the Pinjore Stage (basal Pleistocene) of the Upper Siwaliks near Chandigarh, India.

REPRESENTATIVES of Testudines are known from the Lower as well as Upper Siwaliks (Smith 1931). The Lower Siwaliks have yielded nine species of turtles of the genera *Chelonia*, *Trionyx*, and *Emys* (Pascoe 1962). The Upper Siwaliks of the type region are fairly rich in representatives of the Reptilia but these need further study.

This paper records the occurrence of the genus *Geoclemys* and describes a new species, *Geoclemys sivalensis* n. sp., from about 1 km. south-east of Quranwalla (30° 46' 5"; 76° 52' 50") in the type area of Pinjore. The geology of the area has recently been outlined by Sahni and Khan (1959).

The genus *Geoclemys* is a tropicopolitan freshwater land turtle and is represented in the present-day Indogangetic system by *Geoclemys hamoltoni* (Gray 1831). The species lives in well vegetated shallow, clear, freshwater of oxbow lakes and ponds. It is considered that *G. sivalensis*, which is a closely related form, might have inhabited a similar environment. The Upper Siwalik sediments of the Pinjore Stage comprise alternations of clays, gravels, and sands with common cross-stratification, indicative of a fluvial facies.

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SYSTEMATIC PALAEOONTOLOGY

Order CHELONIA (TESTUDINATA)

Family EMYDIDAE Gray 1825

Genus GEOCLEMYS Gray 1855

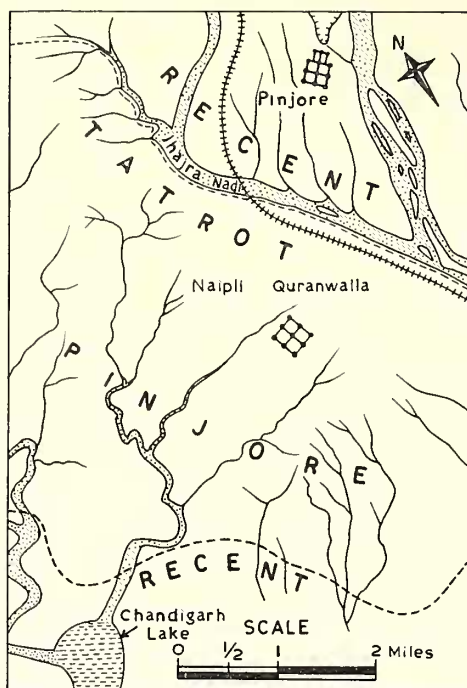
Geoclemys sivalensi sp. nov.

Diagnosis. Carapace oblong and tricarinate, strongly arched transversely, lateral edges straight, margin not flared, nuchal pentagonal, three neurals, and three pairs of pleurals.

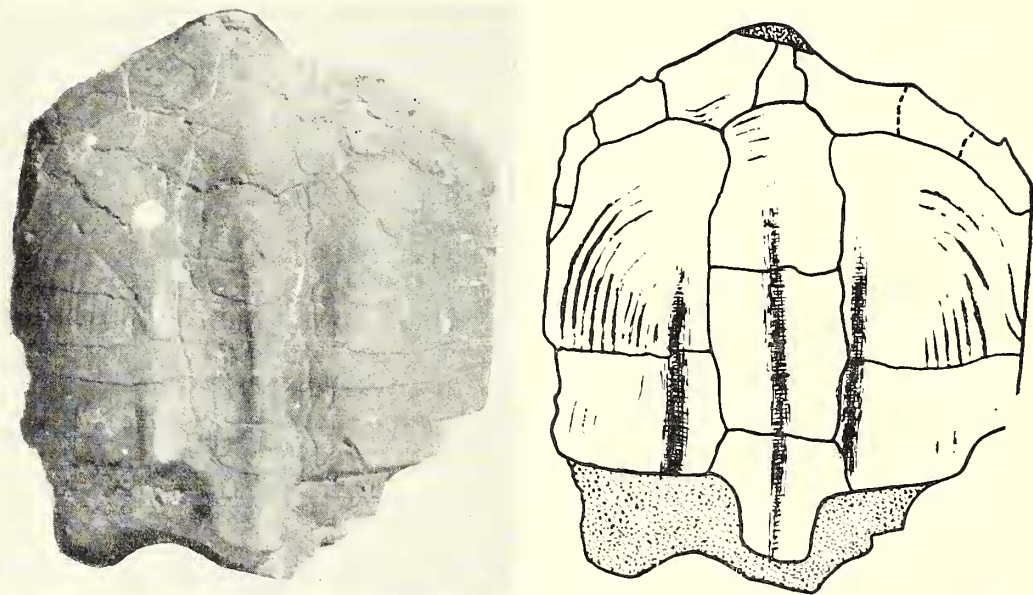
Holotype: Carapace, A/665; Museum of Centre of Advanced Study in Geology, Panjab University, Chandigarh, India.

Locality and horizon: 1 km. south-east of Quranwalla, which is 6 km. northeast of Chandigarh Lake. Pinjore Stage (basal Pleistocene).

Description. The carapace is oblong and tricarinate being strongly arched breadthwise and widest at about one-quarter the distance from the anterior end. The lateral edges of the carapace are straight and taper slightly towards the posterior margin which is not



TEXT-FIG. 1. Locality map.

TEXT-FIG. 2. *Geoclemys sivalensis*, n. sp., dorsal view of carapace, P.U. Mus. A/665. $\times \frac{1}{3}$.

flared. Three interrupted keels or series of nodose prominences are present on the carapace. The pentagonal nuchal abuts against the first neural. There are three rectangular neurals which tend to become hexagonal, the first having a convex anterior end, with an almost straight posterior end and with the lateral edges somewhat concave anteriorly. The second neural is the largest; a prominent median ridge with its highest point near the posterior end runs along the length of the neural continuing from one to the other. The pleurals appear to be in three pairs alternating with the neurals, the third

TABLE 1

Measurements in millimetres: (E) estimated, (R) right side, (L) left side

Carapace: *length* 230 (E), *width* 215, *height* 95 (E).

Nuchal: *length* 26, *maximum width* 20, *anterior width* 11.

Neurals:		<i>length</i>	<i>width</i>	
	1	71	52.5	
	2	67.7	48.5	
	3	51	45	
Pleurals: (L)	<i>maximum length</i>	<i>minimum length</i>	<i>maximum width</i>	<i>minimum width</i>
	1	101	100	74
	2	46	101	—
Pleurals: (R)				
	1	101	101	76
	2	50	96.5	—
Peripherals: (L)		<i>inner length</i>	<i>outer length</i>	
	1	38	50	
	2	36	39	
	3	85	47	
	4	44 (E)	47 (E)	

one is not preserved in the present specimen but its presence can be inferred from the part of the third neural present in the specimen. The first pair of pleurals are roughly rectangular with the antero-lateral edge arched and the surface marked with arched ribs indicating growth stages. Near the proximal end a ridge extends from the posterior margin towards the anterior side and gradually merges into the general level of the pleural. The second pair of pleurals seems to be rectangular but is incomplete in the present specimen, the ridges representing the growth-lines in this case are parallel to the lateral margin. The ridge on the proximal side, extending from posterior margin, runs anteriorly merging again into the general level of the pleural. It is also a continuation of the ridge seen on the first pleural. The third pleural and suprapygal are not seen. Three pairs of marginals are faintly discernible near the anterior margin of the carapace, especially on the left side. The first marginal is the largest, having the shape of a roughly elongated hexagon, and second and third are roughly rectangular. Sutures between neurals and pleurals are prominent.

On the ventral side there are only parts of two fairly preserved mesoplastra; the

sutures of the mesoplastra are visible and form the longest part of the sagittal suture. Fragmentary parts of the entoplastron and hypoplastron are seen. In fact the plastron has been damaged to such an extent that many of the sutures have been obscured.

Remarks and comparison. The present form resembles in general appearance *G. hamoltoni* (Gray), a living species of Indogangetic turtle, also described by Minton (1966) from Sehwan (Pakistan). In *G. sivalensis* the shape and morphology of the pleurals and neurals is similar to that of *G. hamoltoni* but differs in the number of pleurals and neurals which are restricted to three instead of four in the latter. The dimensions of other parts of the carapace differ. *G. sivalensis* resembles *G. hamoltoni* in the presence of three pairs of central ridges on the lamina which also suggests that the forms represent young stages.

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